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A NATIONAL SURVEY OF PUBLIC ATTITUDES
TOWARD PRESCRIBED FIRE POLICIES

FINAL REPORT FOR COOPERATIVE AGREEMENT NO.
INT-89401-RJUA with
COLORADO STATE UNIVERSITY

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A National Survey of Public Attitudes
Toward Prescribed Fire Policies

Final Report
Agreement # INT-89401-RJUA

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ABSTRACT

In the aftermath of the summer 1988 fires, a national survey was conducted to determine public attitudes toward prescribed fire policies for areas managed with a preservation mandate. This study examined intention to support prescribed fire, attitudes toward prescribed fire and beliefs regarding the outcomes of the prescribed fire. Knowledge about wildfire was also assessed. At the national level, results indicate support and opposition for the policies is near equal. However, there is slightly more support than opposition for the policies in the region most affected by the fires (Montana and Wyoming). Positive attitudes toward the policies were related to the belief that they result in improvements to wildlife, the occurrence of natural events and the removal of dead vegetation. Negative attitudes toward the policy were related to beliefs that the policies result in fires out of control, destroyed scenery, animals losing their home, threats to humans and effects to private property. Tests of knowledge about the effects of wildfire indicated that those in the region affected had more accurate knowledge about the outcomes of fire than those at the national level and that those with positive attitudes toward the policy are more knowledgeable about the effects of fire than those with negative attitudes. Policy makers will face difficulties in re-structuring fire policy so that it reaches the approval of a large majority of individuals in our country. Managers must focus educational efforts to improve understanding of the effects of fire and fire policy.

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Introduction

Over the past three decades land management agencies in the United States have been gradually refining policies to deal with fire which occurs in areas where a preservation or wilderness mandate prevails. These policies, known commonly as "controlled burn", "prescribed burn", or "let burn", specify conditions under which fires should be allowed to continue without intervention measures. They reflect a view that 1) areas with a preservation mandate should be managed so that natural processes predominate, and 2) fires are important natural events which are instrumental in the dynamic processes shaping wilderness ecosystems (Hendee, Stankey and Lucas 1978). Justification for prescribed fire policies is supported largely by findings in the biological sciences (Kilgore 1987). However, as noted by Daniels and Mason (1985), other factors such as political, economic, social and physical factors, will limit decisions about the acceptability of fires. In this regard it has been recognized that the viability of fire management policy is dependent largely on the extent to which fires, when they actually occur, exceed the tolerances of key publics (Bird and Lucas 1985).

Indeed, the fires which occurred in much of the western U.S. during the summer of 1988 have provided the most critical test of prescribed fire policy. They were reported to have burned nearly 4 million acres (Newsweek 1988) and have been referred to as the most significant ecological event in the history of national parks (Schullery 1989). The magnitude of fire effects was sufficient to raise the topic of prescribed fire policy to national prominence and has prompted strong debate over the

basis for prescribed fire policy, the competence of management officials and the integrity of our entire philosophy of wilderness management (Newsweek 1988a,1988b; New York Times 1988a, 1988b). These events have culminated in a re-evaluation of prescribed fire policy and a decision that, temporarily, all prescribed fire policies for National Parks and Wilderness areas will be rescinded (Denver Post 1989).

Re-evaluation of fire policy will involve a study of the social, economic, biological and political aspects of fire policy. The focus of our study was on social considerations relevant to fire policy. In particular, we examined attitudes, beliefs and behavioral intentions regarding fire policy and knowledge about the effects of wildfire. This information is important because 1) as recognized in land management legislation (Culhane and Friesema 1979) public preference is a central factor to be weighed in making policy decisions, 2) information about beliefs concerning fire can provide a basis for structuring public education programs regarding fires (Carpenter, Taylor, Cortner, Zwolinski, and Daniel 1987) and 3) this information can provide a baseline against which long term societal trends and shifts in public awareness can be measured (Taylor and Mutch 1986).

This study focused on both national attitudes and attitudes of those in the region most affected by the summer 1988 fires. Representation at the national level was important because of the broad implications of prescribed fire policy to the future of federal lands and land management philosophy. Furthermore, while

in most cases a national attitude survey regarding land management issues would be untenable because of the lack of public awareness of the topic, a national survey regarding fire policy was appropriate because of the likely influence of media attention in shaping and polarizing public attitudes. This study also focused on those in the region most affected by the fire because the results of fire policy decisions are more likely to have a direct effect upon them and because of the intensified effects of both the media and the fires on their attitudes.

Methods

Data for this study were collected using a telephone survey during the months of March and April, 1989. Two strata were identified; 1) the affected region which we defined as the states of Wyoming and Montana, and 2) the nation which included the remaining 48 states. It was estimated that a sample size of 400 for each strata would yield estimates $\pm 5\%$ within a 95% confidence interval. Sampling within strata was conducted using a two staged Waksberg random digit dialing design (Waksberg 1978).

The survey instrument measured attitudes toward the prescribed fire policy, intentions to support the policy, and beliefs about the outcomes of the policy. (See Fishbein and Ajzen 1976 and Ajzen and Fishbein 1980 for a description of the theory and method which guided this study). In measuring these concepts, subjects were first introduced to the topic by a description of the prescribed fire policy. Subjects were told this is a policy that allows naturally caused forest fires to burn themselves out if 1) the fire occurs in a natural area set

aside by the government, and 2) the fire is not threatening private property.

Intention to support was assessed by asking subjects if it was extremely true, quite true, slightly true, neither true or false, slightly false, quite false, or extremely false that they support a prescribed fire policy question. Using three separate questions, attitudes were measured by asking whether following a prescribed fire policy would be extremely, quite, slightly or neither 1) good or bad, 2) beneficial-harmful, and 3) wise or foolish. Belief strength was measured by reading 10 statements and asking subjects whether they agreed or disagreed (either extremely, quite, slightly or neither) that the statement described an outcome of a prescribed fire policy (see Table 1). Belief evaluation was obtained by asking subjects whether those same 10 outcomes would be extremely, quite, slightly or neither good or bad. The ten outcomes listed were developed from open-ended responses made by subjects during pre-test procedures. Other questions asked regarding knowledge about wildfires were replicated from previous studies (Stankey 1976; McCool and Stankey 1986). Five different questions were asked (See Table 2) regarding the outcome of forest fires. Subjects were read each statement and asked if it was basically true, basically false or indicate they were not sure of the answer.

Additional questions were placed on the questionnaire to provide a background description of subjects. Questions were asked about participation (in the last 12 months) in 10 different outdoor recreation activities, past visitation to Yellowstone

National Park, education level, size of home community, and race.

In the first stage of analysis, descriptive statistics were computed to determine overall support for the fire policy. Subjects were then divided into four groups; those from the regional strata and those from the national strata who had positive attitudes, and those from the regional strata and those from the national strata who had negative or neutral attitudes. To obtain an understanding of the basis for support/opposition these groups were compared on all other study measures.

Results

After the first and second stage of sampling, the national sample included 522 subjects and the affected region group reached 391 subjects.

Overall, results indicted slightly positive support for the prescribed fire policy among those in the affected region, while the national sample remained evenly divided. Fifty-five percent of those from the affected region would support the controlled burn policy, 41.3% would not support the policy, and 3.7% were undecided. For the national sample, 48% would support the prescribed fire policy and 45% would not, while 7% were undecided.

Those with positive attitudes toward the policy comprised 53.7% of the national group and 56.8% of the regional group, while those with negative or neutral attitudes were 46.3% and 43.2% respectively.¹ These four groups were found to differ

¹ A test for predictive validity of measures revealed a strong capability for prediction of intentions to support ($R^2=.75$), with both attitude ($b=.76$) and subjective norm ($b=.14$) statistically significant. The correlation between attitude and the belief strength-evaluation index, .67, was also significant at $p \geq .001$.

on each of the 10 beliefs about outcomes of prescribed fire policy (Table 1). In general, mean scores indicate that those with negative attitudes disagree that the prescribed fire policy will result in outcomes which they rate "good" (improved conditions for wildlife, saving money,) and agree it will result in outcomes they rate "bad" (destroys natural settings, allows fires to get out of control, affects private property, destroys scenery, results in many animals losing their homes, causes threats to human lives). Conversely, those with positive attitudes agreed that the prescribed fire policy would result in outcomes they rated "good" (improves conditions for wildlife, allows natural events to occur, removal of dead vegetation) and disagreed or neither agreed or disagreed it would result outcomes they rated "bad" (destroys natural settings, causes threats to human life). Other differences indicated that both those with positive and negative attitudes agreed the prescribed fire policy destroys scenery and results in many animals losing their homes, both "bad outcomes". However, those with negative attitudes had much more extreme means scores on these items for both strength of belief and belief evaluation. Similarly, both groups agreed that the policy allows natural events to occur and results in the removal of dead vegetation, both positive outcomes, however the positive attitude group had more extreme scores on these items.

Another pattern in the findings revealed the differences between those in the affected region and those in the rest of the nation. Among subjects with negative attitudes, those within the region affected had stronger agreement that the policy would

allow fires to get out of control and would affect private property. A number of differences were also noted between the regional and national positive attitude groups. The positive attitude group from the affected region agreed more strongly that the policy would allow natural events to occur, let fires get out of control and affect private property. They also had greater agreement that the policy would result in removal of dead vegetation and rated that more positively. The positive attitude national group had stronger agreement that animals would lose their homes and rated that outcome more negatively.

Overall, it is interesting to note that those outcomes which produced the greatest separation among groups included "allows fires to get out of control", "affects private property", "destroys scenery", "results in many animals losing their homes", and "threats to human life".

Knowledge About Wildfires. The four groups differed widely on response to the true-false questions regarding wildfires (Table 2). The same pattern appeared on four of the five items; the positive attitude group in the affected region had the highest proportion of correct responses, followed by the negative attitude group in the affected region, the positive attitude group in the national sample, and the negative attitude group in the national sample last. Differences between groups were quite large on these items. For example, the differences between the national-negative attitude group and the region affected-positive attitude group ranged between 30% and 50% on four of the five items. Additionally, when compared to the regional group, there

were larger proportions of the national group who indicated they did not know the answer to the knowledge statements.

Interestingly the pattern of findings on the fifth item, "Complete control of all forest fires would reduce the habitat of animals such as elk" was quite different than for the other items. Greater proportions of the national sample (both positive and negative) gave correct responses on that item compared to those from the region affected.

Recreation Participation and Socioeconomic Differences.

When the four groups were compared on outdoor recreation participation, results indicated that those from the affected region were more likely to be involved in outdoor recreation than those from the rest of the nation. Only a few differences, however, appeared related to attitudes toward the prescribed fire policy. Most prominent was in the region affected; when compared to the negative attitude group, those with positive attitudes had a higher proportion of individuals participating in overnight backpacking (21% versus 12%), were more frequent visitors to Yellowstone National Park in the past 12 months ($x=4.6$ visits versus $x=2.7$ visits), had higher levels of education ($x=14.1$ years versus $x=13.1$ years) and had higher proportions of individuals residing in large towns.

Implications

One purpose of this study was to provide public preference input for re-evaluating fire policy. The polarization we found on the prescribed fire policy suggests no clear cut direction to managers and policy makers in meeting public preference. In fact, results highlight the difficulty involved in making a wise

decision about the future of prescribed fire policies: our findings suggest that it will be difficult to reach a solution that has approval by a large majority of individuals.

The second purpose of this study was to provide information that would be useful in developing public education campaigns. In this regard, our findings support the frequent calls for increasing and improving wildfire educational program efforts (Baas, Haas, Ross and Loomis 1985, Bird and Lucas 1986; Carpenter and others 1987; Cortner, Zwolinski; Carpenter and Taylor 1984; McCool and Stankey 1986; Taylor and Mutch 1986; Taylor and Daniel 1984). Educational programs are needed because a substantial proportion of the Americans are illiterate about wildfire. Furthermore, our findings suggest that as knowledge about fires and fire policy increases, people's support of prescribed fire policy increases. However, while increased education may decrease controversy, it cannot be justified as a method of eliminating opposition to prescribed fire policies. For example, one might be quite knowledgeable about the effects of wildfire but oppose prescribed fire policies because of strong beliefs that the policies would lead to negative effects on humans and private property. Increased education is important because a literate public will be better able to participate in policy decisions and assist in reaching decisions which are compatible with societal goals.

Applying the data introduced here, managers might choose among several strategies in developing education campaigns. The first would be to provide information which alters agreement or

disagreement regarding one or more of the ten outcomes which people most readily associated with the fire policy. For example, it is apparent that a substantial number of people have inaccurate beliefs that the policy results in wildlife losing their homes. It might be useful to provide information which clarifies this misperception. Another strategy might be to attempt to change people's evaluation of a particular outcome. For example, many people evaluated removal of dead vegetation as only a slightly positive outcome. Information which focused on the result of this fuel build-up might alter how its removal would be evaluated. The third strategy might be to introduce new outcomes to the list of ten we identified as being the most salient to the public. For example, information might emphasize that the prescribed fire policy creates more food for many animals. As a fourth strategy, managers might introduce information about the prescribed fire policy which indicates what significant others think about the prescribed fire policy (i.e. influence subjective norms). Although our study did not specifically examine the role of "relevant others" in influencing intentions to support the policy, other research suggests the importance of a ranger's influence on people's attitudes toward fire policies (Baas et al. 1985). Certainly the Smokey Bear character has had an important influence on attitudes toward fires and might prove useful in re-educating the public on the roles of wildfires and fire policies.

The third purpose of this study was to provide a baseline against which societal trends can be established. Previous studies have suggested that public attitude toward fires and

support for prescribed fire is changing (McCool and Stankey 1986; Taylor and Mutch 1986). Results of this study cannot repudiate this suggestion. However, they do raise the possibility that previous findings may apply primarily to specific regions of the country most affected by fires. For example, we found fire knowledge results generally similar to McCool and Stankey (1986) when we compared our Montana and Wyoming group to their recent study of wilderness users in Montana. However, our national level sample had much lower knowledge scores than the Wyoming and Montana group, raising the possibility that change has occurred more in that Montana-Wyoming region.

Future research which is attentive to regional variation will assist in verifying the extent of change in national public attitudes and will assist in evaluating future educational efforts.

Conclusion

While biological information may provide support for a prescribed fire policy in areas managed with a preservation mandate, that alone is not sufficient justification for its implementation. Establishing fire policy has a critical socio-political component. In this case the fact that people appear poorly informed about the outcomes of fire policy and fire effects adds controversy. The fires of 1988 and the re-evaluation of policy provide a case study which reinforces what most managers have come to realize: modern forestry is heavily involved in educating and communication with the public.

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Table 1. Beliefs about the outcome of prescribed fire policies by attitude/regional group.¹

Outcome of Policy Response Measure	----- National -----		- Region Affected -	
	Negative Attitude Group Means	Positive Attitude Group Means	Negative Attitude Group Means	Positive Attitude Group Means
Improves conditions for wildlife.				
Agree-Disagree	-1.1 ^a	0.9 ^b	-1.1 ^a	1.2 ^b
Good-Bad	1.4 ^a	1.8 ^b	1.3 ^a	2.0 ^b
Destroys natural settings.				
Agree-Disagree	1.7 ^a	0.1 ^b	1.7 ^a	0.1 ^b
Good-Bad	-2.1 ^a	-1.2 ^b	-1.8 ^b	-0.9 ^c
Allows natural events to occur.				
Agree-Disagree	0.5 ^a	1.0 ^b	0.6 ^a	1.6 ^c
Good-Bad	0.5 ^a	1.6 ^b	0.4 ^a	1.6 ^b
Allows fires to get out of control.				
Agree-Disagree	1.7 ^a	-0.2 ^b	2.3 ^c	0.8 ^d
Good-Bad	-2.7 ^a	-2.3 ^b	-2.7 ^b	-1.8 ^c
Saves money by not fighting fires.				
Agree-Disagree	-0.3 ^a	0.5 ^b	-1.0 ^c	0.5 ^b
Good-Bad	-1.8 ^a	-0.3 ^b	-1.8 ^a	0.3 ^b
Affects private property.				
Agree-Disagree	1.0 ^a	-0.1 ^b	1.9 ^c	0.9 ^a
Good-Bad	-2.5 ^{a,b}	-2.3 ^{a,c}	-2.6 ^b	-2.1 ^c
Results in the removal of dead vegetation.				
Agree-Disagree	1.4 ^a	1.7 ^b	1.7 ^{b,c}	2.2 ^d
Good-Bad	0.2 ^a	1.0 ^b	0.8 ^{b,c}	1.7 ^d

Destroys scenery.

Agree-Disagree	2.4 ^a	1.1 ^b	2.2 ^a	0.8 ^b
Good-Bad	-2.6 ^a	-1.7 ^b	-2.3 ^c	-1.3 ^d

Results in many animals
losing their homes.

Agree-Disagree	2.3 ^a	1.1 ^b	2.3 ^a	0.4 ^c
Good-Bad	-2.6 ^a	-2.2 ^b	-2.6 ^a	-1.9 ^c

Causes a threat to
human life.

Agree-Disagree	1.3 ^a	-0.6 ^b	1.4 ^a	-0.5 ^b
Good-Bad	-2.8	-2.7	-2.9	-2.7

¹ Tests for differences between means were conducted using oneway analysis of variance. F-Test statistics were significant on all items except the Good-Bad scale for "causes threats to human life". Means with different superscripts (^a ^b ^c) were found to be significantly different using Student-Newman-Keuls post hoc test for differences between means.

Table 2. Knowledge about Wildfire for Those with Positive Versus Negative Attitudes by the National Group and the Region Affected Group.¹

Knowledge Statement ²		--National-- Attitude Group		--Regional-- Attitude Group	
		Posi- tive	Nega- tive	Posi- tive	Nega- tive
Forest fires usually result in the death of the majority of the animals in an area. (F)	% True	65.2	50.9	46.2	22.1
	% False	19.4	34.2	45.0	67.1
	% Don't Know	14.9	14.9	8.9	10.8
Most forest fires in the west are started by lightning. (T)	% True	36.4	42.7	59.8	66.7
	% False	36.8	31.3	28.4	20.3
	% Don't Know	26.9	26.0	11.8	13.1
Complete control of all forest fires would reduce the habitat of animals such as elk. (T)	% True	37.6	40.7	33.9	31.2
	% False	33.9	31.8	51.2	50.7
	% Don't Know				
Forest fire often proves useful in making minerals and nutrients available to plants and trees. (T)	% True	40.1	56.2	66.9	84.2
	% False	37.2	21.7	17.2	6.3
	% Don't Know	22.7	22.1	16.0	9.5
Forest fires can be an important force in controlling outbreaks of disease and insects in forests. (T)	% True	37.2	61.9	71.0	85.6
	% False	35.1	15.3	14.8	5.4
	% Don't Know	27.7	22.8	14.2	9.0

¹ Statistically significant differences between groups were found on all items using Chi Square ($p \leq .001$).

² The correct answer to the question is indicated in parentheses as T- True or F - False. Correct answers were taken from Stankey (1976).

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Table 1. Percent Participation in Outdoor Recreation Activities During the Past Twelve Months

Activity	Participation	
	National n=522	Montana/Wyoming n=394
overnight backpacking	7.5%	17.3%
day hiking	28.1	47.2
camping	34.7	56.6
fishing	43.1	58.4
hunting	18.4	36.5
horse riding	17.0	24.9
skiing	20.7	30.2
snowmobiling	6.5	18.5
boating	43.0	41.2
birdwatching	29.3	29.8

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Table 2. Visitation to Yellowstone

Visitation Question	Visitation	
	National n=522	Montana/Wyoming n=394
Have you ever visited Yellowstone National Park?		
Yes	25.8%	87.1%
No	74.2	12.9
Would you say it is likely or unlikely that you will visit Yellowstone in the next 2 years?		
Likely	30.8%	75.9%
Neither	2.1	1.5
Unlikely	67.1	22.6
As you may know several forest fires occurred in Yellowstone National Park last year. Do you think Yellowstone National Park is a more interesting place or less interesting place to visit as a result of the fires?		
More	28.3%	45.9%
Neither	34.2	26.9
Less	37.5	27.2
Are you planning a trip or have you taken a trip to Yellowstone for the purpose of seeing the effects of last summers fires?		
Yes	6.0%	35.8%
No	94.0	64.2

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Table 3. Percentage Responding Correctly to Fire Knowledge Test Items

Question (answer)	Percentage Responding Correctly		% correct responses from a study of wilderness users	
	National n=522	Montana/Wyoming n=394	1971	1984
Forest fires usually result in the death of the majority of the animals in an area. (F)	27.3%	57.9%	52%	51%
Most forest fires in the West are started by lightning. (T)	39.8	63.2	63.	63.
Complete control of all forest fires would reduce the habitat of animals such as elk. (T)	39.3	32.1	50	59.
Forest fire often proves useful in making minerals and nutrients available to plants and trees. (T)	48.8	76.6	55.	74.
Forest fires can be an important force in controlling outbreaks of disease and insects in forests. (T)	50.5	79.4	67.	54.

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*McCool and Stankey -- Visitor Attitudes Toward Wilderness Fire Mgt. Policy 1971-84

Table 4. Beliefs and Evaluations of Outcomes of the Controlled Burn Policy

Question		National n=522	Montana/Wyoming n=394
Do you agree or disagree that following a controlled burn policy improves conditions for wildlife?			
	Agree	49.0%	53.8%
	Disagree	44.6	39.1
Are improved conditions for wildlife good or bad?			
	Good	80.5	84.0
	Bad	15.1	10.4
Would you agree or disagree that following a controlled burn policy destroys natural settings?			
	Agree	65.4	63.2
	Disagree	29.6	32.5
Is destroying natural settings good or bad?			
	Good	13.8	16.8
	Bad	78.8	69.0
Would you agree or disagree that following a controlled burn policy allows natural events to occur?			
	Agree	66.0	75.4
	Disagree	25.0	17.8
Is allowing natural events to occur good or bad?			
	Good	71.3	70.1
	Bad	18.4	16.8
Would you agree or disagree that following a controlled burn policy fires can sometimes get out of control?			
	Agree	59.8	78.4
	Disagree	35.0	18.6
Is making it difficult to control the effects of fire good or bad?			
	Good	3.3	5.6
	Bad	95.0	89.8
Would you agree or disagree that following a controlled burn policy costs less money than fighting a fire?			
	Agree	53.2	46.1
	Disagree	40.0	45.0

Table 4 (continued). Beliefs and Evaluations of Outcomes of the Controlled Burn Policy

Question		National n=522	Montana/Wyoming n=394
Are alternative approaches costing less money than fighting a fire good or bad?	Good	28.5	27.5
	Bad	64.2	60.6
Would you agree or disagree that following a controlled burn policy affects private property?	Agree	57.9	79.1
	Disagree	36.2	16.8
Are fires affecting private property good or bad?	Good	4.6	3.1
	Bad	93.3	94.1
Would you agree or disagree that following a controlled burn policy results in the removal of dead vegetation?	Agree	81.5	88.8
	Disagree	12.4	7.6
Is the removal of dead vegetation good or bad?	Good	57.3	74.6
	Bad	31.2	16.3
Would you agree or disagree that following a controlled burn policy destroys scenery?	Agree	84.5	79.4
	Disagree	13.0	18.8
Is destroying natural scenery good or bad?	Good	6.7	8.4
	Bad	89.1	82.2
Would you agree or disagree that following a controlled burn policy results in many animals losing their homes?	Agree	82.2	73.5
	Disagree	15.9	23.9
Would many animals losing their homes good or bad?	Good	3.1	5.3
	Bad	93.1	89.8

Table 4 (continued). Beliefs and Evaluations of Outcomes of the Controlled Burn Policy

Question		National n=522	Montana/Wyoming n=394
Would you agree or disagree that following a controlled burn policy causes a threat to human life?			
	Agree	53.8	56.5
	Disagree	43.5	39.4
Is threat to human life good or bad?			
	Good	1.5	1.5
	Bad	97.7	97.2

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Table 5. Affective Response to Controlled Burn Policy

Question		National n=522	Montana/Wyoming n=394
Overall, would following a controlled fire policy be good or bad?			
	Good	51.8%	54.7%
	Bad	42.1	40.2
Would following a controlled burn policy be beneficial or harmful?			
	Beneficial	51.6	55.7
	Harmful	39.8	39.2
Would following a controlled burn policy be wise or foolish?			
	Wise	52.2	54.7
	Foolish	39.4	39.9
Would your supporting a controlled burn policy be wise or foolish?			
	Wise	55.2	56.0
	Foolish	36.9	38.9

Table 6. Subjective Norm Regarding Controlled Burn Policy

Question		National n=522	Montana/Wyoming n=394
Would most people who are important to you think that you should or should not support a controlled burn policy?			
	Should	46.0%	45.3%
	Should Not	37.5	41.5

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Table 7. Behavior Intention Regarding Controlled Burn Policy

Question	National n=522	Montana/Wyoming n=394
Is it true or false that you support a controlled burn policy?		
True	48.1%	55.1%
False	45.0	41.3

Table 8. Descriptive Characteristics

Question	National n=522	Montana/Wyoming n=394
Does the term "environmentalist" describe you accurately or inaccurately?		
Accurately	65.4%	54.2%
Inaccurately	28.1	36.8
Which is the highest level of education that you have completed?		
None	.2%	0.0%
Elementary	3.9	4.1
High School	44.4	43.7
College	43.1	40.6
Some Graduate School	4.0	5.6
Graduate or Professional Degree	4.6	6.1
What is the approximate population of the town or city you live in?		
Less than 49,999 people	59.2	74.3
More than 50,000 people	37.5	24.4

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Table 8 (continued). Descriptive Characteristics

Question	National n=522	Montana/Wyoming n=394
Which of the following best describes your racial or ethnic identification?		
Black	8.6%	.5%
White	83.9	94.1
Hispanic	4.0	2.6
Native American	1.3	2.3
Asian	1.5	.3
Other	.6	.3

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THE EFFECT OF CURIOSITY SEEKING ON
YELLOWSTONE NATIONAL PARK VISITATION

Submitted to
The Trends Symposium

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Michael Yuan will present the paper

ABSTRACT

Current visitation trends may be temporal and reflect changes of a large or unique magnitude such as with disasters. Convergence behavior, in the form of curiosity, is examined as a main reason why people visit natural disaster sites such as Yellowstone National Park which had extensive forest fires in 1988. Based on the 172 people who responded in the National Survey of Public Attitudes Toward Controlled Burn Fire Policy that they are planning a trip or have taken a trip to Yellowstone to see the effects of last summer's fires, two groups were formed and labeled as disaster seekers and non-disaster seekers. Ten questions concerning beliefs of the controlled burn policy for the two groups were analyzed with frequencies and t-tests. The results indicated that more people responded they were disaster seekers than non-disaster seekers on six of the beliefs. Because of the large number of disaster seekers, the most important effects of the fires on visitation may not be apparent for several years and that current visitation patterns may not reflect normal conditions. Visitors attracted by disasters may be only one-time users to fulfill their curiosity, and may not generate the word-of-mouth publicity that attracts new visitors.

Introduction

Regardless of whether a site was a popular tourist destination in the past, it may become one after undergoing changes of a large or unique magnitude. For example, after the Mt. St. Helens eruption in 1980, the area became very popular for people to visit. Visitation to the area increased as many people came out of curiosity to explore the changes brought on by the eruption. The physical changes at Mt. St. Helens can be described as a form of disaster. Barton (1969) defines a disaster as part of a larger category of collective stress situations. The collective stressors can be either internal (caused by sources inside the social system) such as depression, riots, revolutions, etc., or they can be external. Natural disasters, which are of interest here, fall into the realm of external stressors; these may include floods, hurricanes, earthquakes, fires, volcanic eruptions, and other types of destruction. People tend to converge at the site of such disasters. There is an universality of convergence following a disaster as shown by the people converging on Mt. St. Helens following the eruption (Cunningham, et al 1986)

Purpose of the Study

The purpose of this study was to examine why people visit natural disaster sites and the effects on Yellowstone visitation trends. Do visitors want to see a natural phenomena and the processes that accompany it? Or, are they primarily attracted by the desire to see the death and destruction of the area, without much appreciation for the underlying processes that are occurring? While members of the first group may feel the disaster is regrettable, they also feel that it is part of the natural process and, as such, is necessary, perhaps even beneficial. The second group does not see the event as being primarily part of the natural processes; instead its members view the disaster as horrible, devastating, without much possible merit.

An area's visitors may have more and stronger reasons for visitation than those related to disasters, but it is important to focus on disaster-related aspects to determine their

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impact on the area's visitation characteristics. After describing the disaster process and the different types of convergence behavior, this paper will examine one type of convergence behavior in more detail. The behavior to be studied is labeled "curiosity" and will be examined as it relates to tourists visiting Yellowstone National Park after the forest fires that occurred in that area during the summer of 1988. The aftermaths of the Yellowstone fires demonstrate the process of convergence after a disaster. Visitation rates to Yellowstone during the 1989 period showed a record number of people coming to the park. An important question then arises: how much of this increase is due to convergence behavior on a disaster caused by the fires, and what are the implications for future visitation?

Background

During the summer of 1988, historically dry conditions created an extremely vast number of forest fires in the Western United States. Some of the largest fires were in the Yellowstone area of southern Montana and northern Wyoming. In the Greater Yellowstone Area (which comprises parts of six national forests and two national parks), ten major fires burned nearly 1.5 million acres. This occurred "despite the efforts of 9,500 firefighters, including 4,220 military personnel from the Army, Navy, Air Force and Marine Corps, and massive air support, logistic support and technical assistance ..." (Davis and Mutch 1989). After the fires, concern about their effects on Yellowstone visitation has led researchers to examine the reasons of people coming to the park. Curiosity seeking to examine fire caused disaster has been suggested as a primary reason (Phillips 1988).

Among the definitions of disaster are those that include a temporal element. Depending on the timing of the disaster, a person may have various beliefs and responses to that event. An event (disaster) is defined largely by its time and space elements, and this suggests that disasters follow temporal sequences (Endleman 1952). Barton (1969) has distinguished five phases of disasters. These phases are the pre-disaster period, the period

of detection and communication of threat, the period of relative to unorganized response, the organized response period, and the long-run, post-disaster equilibrium.

These five phases can be grouped into two categories, pre-disaster phase and post-disaster phase. The first two form the pre-disaster phase, while the last three form the post-disaster phase. Studies that have examined the pre-disaster phase suggest that most people stay away from a disaster area because of fear and uncertainty (Schiff 1977; Kushnir 1982; Payne and Pilgram 1981). During the later stages, curiosity replaces fear, which then prompts people to visit the area to find out what happened (Murphy 1986; Thompson and Hawkes 1962; Saunders and Kreps 1987).

This emphasis on response to disasters has lead some researchers to focus on convergences as a collective response in disaster situations (Cunningham et al. 1986). Fritz and Mathewson (1957) focused on convergence as one particular type of response in disaster situations and identified five major types of convergence. The types of convergent behavior are the returnees, the anxious, the helpers, the curious, and the exploiters. These types are differentiated by their reason for entering the disaster area. The returnees are those who live in the area and are returning to their homes after the disaster. The anxious are considered those who are indirectly affected by the disaster, but have ties with those who were directly affected. Those who come to the disaster site to offer aid to the victims are identified as helpers. The curious are those who come to see first-hand the effects of the disaster. Lastly, the exploiters are those who come with the intention of seeking personal gain.

Cunningham et al. (1986) also identified another type of convergent behavior. In a study that examined the economic, social, and psychological consequences of a natural disaster, they concluded that recreational convergence was an important type of behavior. "Recreational convergence refers to individuals converging on a disaster scene in recreational vehicles for the purpose of having fun" (Cunningham et al. 1986:263). These people are attracted by disasters which are a focus point for recreational activities. Phillips

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(1988), in a study of tourists reactions to the Yellowstone fires, found that about 80 percent of the respondents perceived the fires as a damaging force in the park. This subgroup of respondents also indicated that only about 30 percent would change their plans in visiting Yellowstone during the following year. In addition, about 61 percent of the subgroup indicated that the fires will be a major attractant of visitors to the park because of curiosity seeking.

Of the six types of convergence behavior, curiosity-seeking is the one of particular interest in this study. This paper will address two particular reasons of curiosity-seeking: disaster seeking and non-disaster seeking. Disaster seekers in Yellowstone are described as being primarily attracted by the destruction-related characteristics of the area such as dead trees, burned property, and adverse impacts on wildlife. Non-disaster seekers, on the other hand, are attracted primarily by non-destruction related aspects such as scenery and healthy wildlife.

Methods

Data for this study were from the "National Survey of Public Attitudes Toward Controlled Burn Fire Policy" which examined: 1) public attitudes toward the Yellowstone fires; 2) public attitudes toward the controlled burn policy; and, 3) the effect that the Yellowstone fires may have on future park visitation.

Data were collected from a national sample via telephone interviews conducted by trained interviewers during the months of March and April, 1989. The sample was stratified by region defined by the states most affected by the fires (Montana/Wyoming region) and the rest of the states (national region). Sampling within each strata utilized a Waksberg (1978) two-stage random digit dialing procedure. From the first-stage sample, a random list of numbers from AT&T was used for the interviews. This stage produced 2169 phone numbers, of which 266 led to interviews. The second-stage consisted of using the working non-business numbers from the first stage as a cluster and adding one to the

last four digits. Sampling from the second stage was repeated until about 400 interviews from each strata were completed. Of the interviews completed, 522 were from the national stratum and 391 were from the Montana/Wyoming stratum.

The questions used in the fire policy study were based on the theory of Reasoned Action. This theory states that intention to support a particular action is based on attitudes and subjective norms regarding that action (Fishbein and Ajzen 1975; Ajzen and Fishbein 1980). The theory also adds that attitudes toward the action are determined by the strength of beliefs about the outcome of the action and its related evaluation. Data for this initial procedure were obtained from pilot tests conducted at the University of Illinois, Colorado State University, and the University of Montana. The pilot tests examined the beliefs held by people concerning the controlled burn policy. The most salient beliefs were then included in the phone survey. This final questionnaire was pilot-tested and minor revisions were made. The questionnaire elicited information from eight areas: participation in outdoor recreation activities, visitation to Yellowstone, knowledge about fires, beliefs and evaluations of the outcomes of the controlled burn policy, affective response to the controlled burn policy, subjective norm regarding the controlled burn policy, behavior intention regarding the controlled burn policy, and descriptive characteristics of the subjects.

This study used the ten questions concerning beliefs of the controlled burn policy from the 172 people (18.7%) who responded that they are planning a trip or have taken a trip to Yellowstone to see the effects of last summer's fires. The belief questions were further grouped into internal environmental beliefs, such as concerns for wildlife and scenery, and external environmental beliefs, such as concerns for private property and saving money. The questions used attempted to determine visitors' beliefs, about various aspects of fire processes, directly and indirectly related to the control burn policy. While beliefs of the controlled burn policy does not directly indicate whether a person will visit Yellowstone, they may be important attributes that contribute to the underlying reasons to

visit the area. The questions were rated on a seven-point Likert scale ranging from extremely agree to extremely disagree. Scaling procedures were then applied that formed two groups of respondents; those who answered extremely agree to slightly agree on the belief questions (one through three on the seven point scale) were labeled as non-disaster seekers, those who answered extremely disagree to slightly disagree (five through seven) were labeled as disaster seekers. Those who were neutral on the belief questions (response of four) were not included in the analysis. Frequencies were determined and T-test analysis applied to determine significant differences between means of the disaster seeking groups and non-disaster seeking groups.

Results

On three of the ten belief questions in the study related to the control burn policy, people's responses suggested that non-disaster related reasons were important aspects for visiting or having visited Yellowstone (see Table 1). Two belief questions elicited a very large percentage of responses for the non-disaster group: "policy allows natural events to occur" with 90 percent responding, and "policy remove dead vegetation," with 92 percent responding. One belief question, "policy saves money," had about equal responses from both groups. The remaining six belief questions had a greater percentage of respondents from the disaster-seeking group with 58 to 79 percent of the public responding that they agree with these beliefs. On three of the four beliefs dealing with the external environment (aspects not directly related to natural processes), more people responded that they were disaster seekers. Only the belief that "policy saves money" had higher percentage of responses from non-disaster seekers. On the beliefs concerned with the internal environment (aspects directly related to natural processes), more people responded that they were non-disaster seekers on three of the six beliefs.

While frequency of response for a belief may indicate whether the belief is a valid reason for a person to come to Yellowstone for disaster or non-disaster seeking purposes,

it does not indicate the strength of a response. Dichotomous scales only indicate a range of beliefs but do not take into account actual saliency for that belief. The saliency of the belief greatly influences the actual behavior of a person. For example, a person who indicates that he or she is a disaster seeker may only be driving through the park, passively observing burned areas, while another person who is also labeled as a disaster seeker may be hiking through the area, studying the effects of the fire up close. Both people would be in the same group, but one may have a higher degree of saliency in beliefs than the other. Both the belief and the strength of the belief gives a better indication whether a specific behavior will result.

According to t-test analysis (see Table 1), three out of eight belief questions showed significant differences between disaster and non-disaster seekers (two belief questions did not have large enough group sample sizes for analysis). The three significant beliefs were: "policy allows fires to get out of control" (disaster seeker), "policy saves money" (non-disaster seeker), and "policy destroys scenery" (disaster seeker). Two of the significant beliefs were related to the external environment, but only one was with the internal environment. The significant belief, "policy saves money," had about an equal percentage of responses from both groups, although there was a significant difference between means. This finding indicates that although some beliefs may be held equally by different groups, the strength or saliency may be quite different. In this example, the strength of belief of disaster seekers was significantly stronger than that for non-disaster seekers.

Discussion

Findings from this study show that beliefs of the control burn policy suggest that a large number of people who have taken or are planning to take a trip to Yellowstone to see the effects of the fire are attracted by the opportunity to see disaster areas. Because of this large number of disaster seekers, the most important effects of the fires on park visitation patterns may not be apparent for several years. The beliefs of disaster seekers may lead to

behaviors significantly different than non-disaster seekers. Visitors seeking disaster may be only one-time users there to fulfill their curiosity, and thus not generate the word-of-mouth publicity that attracts new visitors. In the short run, the curiosity of the fires may attract the type of visitor who is not indicative of long-term visitation characteristics. Long-term visitation trends may show that those visiting Yellowstone in the future may be more like non-disaster seekers. While beliefs and the evaluation of the beliefs are only one component of the theory of reasoned action, they are important though in that they give an indication of the attitude toward that action. Further research into subjective norms that lead to intention for behavior is needed to give a complete picture of curiosity seeking behavior on visitation patterns.

This study suggests that those charged with the responsibility of managing Yellowstone National Park and the surrounding areas should recognize that visitation patterns for the next few years may not reflect normal conditions. Attempts to provide fire interpretation for current visitors should be made with the knowledge that different types of information may be more important in the future to accommodate the different needs of a new type of curiosity seeker. The management personnel should also realize that tourists will be motivated to visit the area for a variety of reasons. On six of the ten beliefs included in the study, individuals indicated that they were more interested in disaster rather than non-disaster based beliefs. Educational programs and literature should be developed with this knowledge in consideration. Since some tourists are visiting specifically to see death and destruction, it would be beneficial to acknowledge that a disaster did in fact occur. However, the emphasis should be on the long-term benefits and how a certain amount of death is necessary to bring forth new life. If emphasis is placed on the processes, the disaster-seeking tourists may become more appreciative of nature and its processes and less enthralled with seeing disasters solely for the purpose of viewing destruction.

The results of this study suggest where these educational materials are most needed. While there was an equal number of responses (3 and 3) between those who responded that

they were disaster seeking and non-disaster seeking with the six internal environment variables, this was not the case with the external environment variables. More individuals responded that they were disaster seeking on three of the four external variables. It seems appropriate that park educational programs and literature would concentrate on the animals, vegetation, natural environment and scenery (internal environment). Indeed these variables seem to be the very essence of the park. However, the results also indicate that it is necessary to include information about the external environment, such as the fires' effect on private property, human life, etc., when developing the educational campaign about the fires and the park's natural processes.

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Table 1 - Differences Between Disaster and Non-Disaster Seeking Groups

Outcome of Controlled Burn Policy	N	Disaster Seekers		Non-Disaster Seekers		T-test
		mean	%	mean	%	
<u>Internal Environmental Beliefs</u>						
Improves conditions for wildlife	161	1.79	34	1.87	66	.527
Destroys natural settings	167	1.75	64	1.95	36	.121
Allows natural events to occur	163	1.75	10	1.91	90	#
Remove dead vegetation	170	2.00	8	1.52	92	#
Destroys scenery	171	1.77	75	2.07	25	.043*
Causes animals to loose their homes	165	1.67	71	1.92	29	.067
<u>External Environmental Beliefs</u>						
Causes threats to human life	169	2.06	58	1.90	42	.239
Allows fires to get out of control	169	1.65	70	2.06	30	.005*
Saves money	160	1.65	47	2.08	53	.001*
Affects private property	164	1.97	79	2.25	21	.065

* Significant at the alpha = .05 level.

Disaster seeker group sample size insufficient for t-test analysis